

Recovery Plan Action Status**Plan Name: Draft Revised Recovery Plan for the Santa Cruz Long-toed Salamander****Plan Status: Draft Revision 2****Plan Date: 02-Jul-99****Lead Agency: USFWS****Lead Office: Ventura Fish And Wildlife Office****(805)
644-1766)**

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Santa Cruz long-toed salamander (Ambystoma macrodactylum croceum)	2	1.1.1	Improve the Valencia Lagoon	Not Started			California Department of Fish and Game	Management: Habitat Maintenance and Manipulation, Research: Population Surveys	Contract, Species Expert	There have been informal discussions between the Service, California Department of Fish and Game (CDFG), and California Department of Transportation (Caltrans) regarding management actions necessary to improve Valencia Lagoon. CDFG and Caltrans have had a streambed alterations agreement in place for the last five years (it expires at the end of 2005) for vegetation clearing in the channel here. The problems at this site are numerous, and include sedimentation problems at the lagoon from erosion runoff upstream. The pond (lagoon) likely needs to be improved, and the channel leading into the pond, which is full of sediment, needs to be dug out. Also, vegetation needs to be managed here. Currently, there is no management plan in place to deal with the sedimentation problems at the pond and channel, and to allow for take during these management activities. Population studies are necessary here, to determine the status of the population, and to determine where in

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										the uplands long-toed salamanders are migrating; the uplands here are very fragmented due to residential development.
Santa Cruz long-toed salamander (Ambystoma macrodactylum croceum)	2	1.1.10	Develop and implement a management plan for the McClusky acquisition	Obsolete			U.S. Fish and Wildlife Service, California Department of Fish and Game	Management: Planning	Internal Administrative, Internal Field Assistance, Internal Technical Assistance, Species Expert	McClusky Slough is privately owned, as are the meager uplands and extensive agricultural lands surrounding the aquatic habitat there. Having said that, Mark Silberstein of the Elkhorn Slough Foundation is interested in discussing land acquisition at and near McClusky Slough with private landowners there and the Service, but this hasn't happened yet. This recovery action will be updated in the revision of the recovery plan.
Santa Cruz long-toed salamander (Ambystoma macrodactylum croceum)	2	1.1.11	Implement management actions at Moro Cojo Slough	Not Started				Management: Habitat Maintenance and Manipulation, Research: Population Surveys	Contract, Species Expert	Management actions here should include removing and non-native aquatic predators such as bullfrogs, mosquitofish, and crayfish, if found. Also, removing non-native invasive plants in the uplands. Population studies should occur here, to determine population size and status.

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Santa Cruz long-toed salamander (Ambystoma macrodactylum croceum)	2	1.1.2	Repair the breach in the Seascapes berm, maintain berm and pond	Complete	FY 2000 - FY 2004	FY 2000 - FY 2004		Management: Habitat Maintenance and Manipulation, Research: Population Surveys	Contract, Species Expert	I believe the berm was in Seascapes Pond 1, and this has been repaired, and the pond has a stable population. The management of this pond and vegetation control in the uplands is being implemented through the Seascapes Uplands HCP. Through this HCP, two other mitigation ponds have been created and both contain breeding long-toed salamanders.
Santa Cruz long-toed salamander (Ambystoma macrodactylum croceum)	1	1.1.3	Complete acquisition of Calabasas site and transfer to USFWS	Complete	FY 2000 - FY 2004	FY 2000 - FY 2004	U.S. Fish and Wildlife Service	Acquisition	Internal Administrative, Internal Technical Assistance	Determined by stochastic events. Calabasas Pond and ~ 30 acres of upland are included in the Calabasas Unit of the Ellicott Slough National Wildlife Refuge. Necessary management actions at the pond include repairing the berm at the pond, and removal of non-native invasive vegetation. These actions will likely require assistance from Service (Refuge) personnel and volunteers. Regarding research, population studies at the pond should be conducted, as well as drift fence studies in the uplands. Research on disease (e.g., chytridiomycosis) should be conducted, through dipnetting and examining larvae, and swabbing larvae and adults.

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Santa Cruz long-toed salamander (Ambystoma macrodactylum croceum)	2	1.1.4	Maintain the Calabasas pond at an appropriate level by maintaining and repairing the berm	Planned	FY 2006		U.S. Fish and Wildlife Service, California Department of Fish and Game	Management: Habitat Maintenance and Manipulation	Internal Field Assistance	This is a management action that the Refuge wants to take, but has not done so yet due to lack of funds.
Santa Cruz long-toed salamander (Ambystoma macrodactylum croceum)	2	1.1.5	Develop a management plan for the Calabasas acquisition and update it as appropriate	Planned			U.S. Fish and Wildlife Service, California Department of Fish and Game	Management: Habitat Maintenance and Manipulation	Internal Field Assistance	This is a management action that the Refuge wants to take, but has not done so yet due to lack of funds.
Santa Cruz long-toed salamander (Ambystoma macrodactylum croceum)	2	1.1.6	Continue adaptive management of Ellicott Pond	Ongoing Current	Prior to FY 1995		U.S. Fish and Wildlife Service, California Department of Fish and Game	Management: Habitat Maintenance and Manipulation	Internal Field Assistance	Management actions at the pond and uplands are partial, in that the Refuge has undertaken removal of non-native plants (e.g., eucalyptus, jubata grass). However, Ellicott Pond is not holding water long enough throughout the year, and likely has a leak in it's clay lining. The Refuge has not yet planned to repair the pond, and is not supplementing the pond with well water, both due to costs. Population studies need to occur here.
Santa Cruz long-toed salamander (Ambystoma macrodactylum croceum)	2	1.1.7	Develop conservation agreements and management plans for salamander habitat near Ellicott	Not Started			U.S. Fish and Wildlife Service	Management: Habitat Maintenance and Manipulation	Contract	Lands near Ellicott are privately owned, and the status of three ponds (Green's, Anderson's, and Rancho Road) are uncertain.

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Santa Cruz long-toed salamander (Ambystoma macrodactylum croceum)	2	1.1.8	Investigate acquisition possibilities for Buena Vista site	Complete	FY 2000 - FY 2004	FY 2000 - FY 2004	U.S. Fish and Wildlife Service, California Department of Fish and Game	Management: Other	Internal Field Assistance, Species Expert	The 289-acre Buena Vista property was purchased by CDFG and TPL in 2004, and is proposed to be managed as part of the Ellicott Slough National Wildlife Refuge.
Santa Cruz long-toed salamander (Ambystoma macrodactylum croceum)	2	1.1.9	Develop agreements with private landowners for management of salamander habitat in McClusky Slough	Not Started			U.S. Fish and Wildlife Service	Acquisition: General	Contract	Management actions here should include land acquisition and improvement of aquatic and upland habitats.
Santa Cruz long-toed salamander (Ambystoma macrodactylum croceum)	2	1.2.1.1	Secure land upslope from Valencia Lagoon through conservation easements and/or purchase	Ongoing Current	Prior to FY 1995		U.S. Fish and Wildlife Service, California Department of Fish and Game	Acquisition: Easement	Contract	Although the California Department of Fish and Game may own about 8 parcels in the Valencia neighborhood, there are more undeveloped parcels that should be purchased, as upland sheltering and dispersal habitat. However, we are not aware of any recent proposals to acquire any additional parcels here.
Santa Cruz long-toed salamander (Ambystoma macrodactylum croceum)	2	1.2.1.2	Ensure proper implementation of the Seascape Habitat Conservation Plan	Partially Complete	FY 1995 - FY 1999		U.S. Fish and Wildlife Service	Management: General	Contract	The Center for Natural Lands Management is using funds from the HCP to try to alleviate erosion problems not identified in the HCP. The Service needs to discuss with CNLM that this is not an activity approved in the HCP.

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Santa Cruz long-toed salamander (Ambystoma macrodactylum croceum)	2	1.2.1.3	Rehabilitate upland habitat surrounding Seascape pond	Ongoing Current	FY 1995 - FY 1999			Management: Habitat Maintenance and Manipulation	Contract	This is an ongoing activity in the HCP.
Santa Cruz long-toed salamander (Ambystoma macrodactylum croceum)	2	1.2.1.4	Ensure Salamander Protection Zone regulations are enforced in Larkins Valey/Calabasas area.	Obsolete			U.S. Fish and Wildlife Service	Other: Law Enforcement, Other: Regulations	Internal Administrative, Internal Field Assistance	We are not aware of any "Salamander Protection Zones" (SPZ) in Larkin Valley. The only SPZ we are aware of is in the Valencia lagoon neighborhood.
Santa Cruz long-toed salamander (Ambystoma macrodactylum croceum)	2	1.2.1.5	Implement upland habitat restoration and management at Calabasas	Not Started			U.S. Fish and Wildlife Service, California Department of Fish and Game	Management: Habitat Maintenance and Manipulation	Contract	This is a goal of the Ellicott Slough NWR, but they just don't have proper funding.
Santa Cruz long-toed salamander (Ambystoma macrodactylum croceum)	2	1.2.1.6	Continue to upland habitat restoration and management at Ellicott.	Ongoing Current	Prior to FY 1995		U.S. Fish and Wildlife Service, California Department of Fish and Game	Management: Habitat Maintenance and Manipulation	Contract	Ellicott Slough NWR is removing eucalyptus trees and pampas grass.
Santa Cruz long-toed salamander (Ambystoma macrodactylum croceum)	2	1.2.2	Develop and implement an adequate Habitat Conservation Plan at Willow Canyon	Unknown			U.S. Fish and Wildlife Service	Management: Land Use, Management: Planning	Contract, Internal Administrative, Internal Technical Assistance	We are not aware of a draft HCP in development for this location at this time.
Santa Cruz long-toed salamander (Ambystoma macrodactylum croceum)	2	1.2.3	Restore upland habitat at the McClusky acquisition	Obsolete			U.S. Fish and Wildlife Service, California Department of Fish and Game	Management: Habitat Maintenance and Manipulation, Management: Land Use	Contract	There is no acquisition at McClusky Slough, that we are aware of.
Santa Cruz long-toed salamander (Ambystoma macrodactylum croceum)	2	1.2.4	Develop management plans for privately owned McClusky Slough uplands.	Not Started			U.S. Fish and Wildlife Service	Management: Planning	Contract	
Santa Cruz long-toed salamander (Ambystoma macrodactylum croceum)	3	1.2.5	Investigate additional protection around McClusky Slough	Not Started			U.S. Fish and Wildlife Service, California Department of Fish and Game	Acquisition	Internal Technical Assistance	This has not taken place as of December 2005. However, Service biologist have discussed (in principle) with Mark Silberstein of the Elkhorn Slough Foundation, the topic of land acquisition near McClusky Slough

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Santa Cruz long-toed salamander (Ambystoma macrodactylum croceum)	3	1.2.6	Investigate additional land protection around Moro Cojo Slough	Ongoing Current	FY 1995 - FY 1999		U.S. Fish and Wildlife Service, California Department of Fish and Game	Acquisition	Internal Field Assistance, Species Expert	The Elkhorn Slough Foundation recently purchased 390 acres of land adjacent to lower Moro Cojo Slough. Santa Cruz long-toed salamanders are not known to breed in this stretch of Moro Cojo Slough, but focused surveys have not been conducted. SCLTS are known to breed in Upper Moro Cojo Slough, approximately 1.0 mile east.
Santa Cruz long-toed salamander (Ambystoma macrodactylum croceum)	2	1.3.1	Establish a new pond at Seascape	Complete	FY 1995 - FY 1999	FY 2000 - FY 2004		Management: Other	Contract	Actually, two new ponds have been created in association with the Seascape Uplands HCP, and both ponds have documented breeding by SCLTS.
Santa Cruz long-toed salamander (Ambystoma macrodactylum croceum)	2	1.3.2	Establish a new breeding pond at Bush Gulch/Cuesta Canyon	Unknown				Management: Habitat Maintenance and Manipulation, Research: Management Techniques	Contract, Species Expert	This has been proposed in the recovery plan, and there is a location on this property where a pond could be built. However, this property is privately owned, and we are not aware of any plan on the part of the landowner to build a pond here.
Santa Cruz long-toed salamander (Ambystoma macrodactylum croceum)	2	1.3.3	Monitor and manage the new pond in Larkins Valley.	Not Started			U.S. Fish and Wildlife Service, California Department of Fish and Game	Management: Habitat Maintenance and Manipulation	Contract	This pond is called Suess Pond, and there are currently no plans underway for managing this pond.
Santa Cruz long-toed salamander (Ambystoma macrodactylum croceum)	2	1.3.4	Assess the feasibility of establishing additional ponds in Larkins Valley	Not Started			U.S. Fish and Wildlife Service, California Department of Fish and Game	Management: Habitat Maintenance and Manipulation	Contract	There are currently no plans underway to do this.

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Santa Cruz long-toed salamander (Ambystoma macrodactylum croceum)	2	1.3.5	Manage and monitor the new pond at Ellicott Preserve	Not Started			U.S. Fish and Wildlife Service, California Department of Fish and Game	Management: Habitat Maintenance and Manipulation	Contract	Ellicott Slough NWR wants to build a second pond on the Refuge, called "Prospect Pond". However, due to lack of funding they are not able to undertake this project.
Santa Cruz long-toed salamander (Ambystoma macrodactylum croceum)	3	1.3.6	Investigate the potential for establishing a pond in the drainage to the west of the Buena Vista site.	Not Started			California Department of Fish and Game	Management	Contract, Internal Technical Assistance, Species Expert	This could potentially be accomplished under proposed management by the Refuge. If so, it would be likely accomplished through internal FWS assistance (informal or formal consultation, and Refuge management actions); contractors to build the pond; and assistance and advice from species experts.

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Santa Cruz long-toed salamander (Ambystoma macrodactylum croceum)	2	1.4.1	Prevent losses to the populations by encouraging appropriate actions by public agencies	Ongoing Current	Prior to FY 1995		U.S. Fish and Wildlife Service, California Department of Fish and Game	Acquisition	Contract	The Service is encouraging other agencies to participate in recovery efforts for the species. This includes California Department of Fish and Game, Ellicott Slough National Wildlife Refuge, Elkhorn Slough National Estuarine Research Reserve, California Department of Transportation, and California Department of Transportation. Actions the Service is interested in include: development of a regional (programmatic) Safe harbor Agreement(s), land acquisition, and research.
Santa Cruz long-toed salamander (Ambystoma macrodactylum croceum)	3	1.4.2	Extend Salamander Protection Zones in Santa Cruz County	Not Started				Acquisition	Internal Administrative, Internal Technical Assistance	In fact, the County of Santa Cruz is likely not going to do this, due to lack of funding and political reasons.
Santa Cruz long-toed salamander (Ambystoma macrodactylum croceum)	3	1.4.3	Investigate establishing Salamander Protection Zones in Monterey County	Not Started				Management	Internal Administrative, Internal Field Assistance, Internal Technical Assistance, Species Expert	This has not been discussed with the County of Monterey.

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Santa Cruz long-toed salamander (Ambystoma macrodactylum croceum)	3	1.4.4.1	Evaluate roadkills near Valencia Lagoon to determine if and where tunnels are appropriate.	Ongoing Current	Prior to FY 1995		U.S. Fish and Wildlife Service, California Department of Fish and Game	Research	Species Expert	Surveys along roadsides in Santa Cruz and Monterey Counties are planned during the winter of 2005-06, to be coordinated by species experts (Nina D'Amore, Mark Allaback) and with the help of volunteers (students) from UC Santa Cruz. Bonita Road near Valencia Lagoon will likely be surveyed.
Santa Cruz long-toed salamander (Ambystoma macrodactylum croceum)	2	1.4.4.2	Install salamander tunnels at Seascape as specified in the Habitat Conservation Plan	Complete	FY 1995 - FY 1999	FY 1995 - FY 1999		Management: Habitat Maintenance and Manipulation	Contract	Six tunnels were installed beneath a road at Seascape. They have not been very effective, however, because few SCLTS are making it through them. Biologists have recommended the installation of more extensive and effective drift fences to guide SCLTS to these tunnels, but the funding doesn't currently exist to install additional drift fence arrays.
Santa Cruz long-toed salamander (Ambystoma macrodactylum croceum)	3	1.4.4.3	Determine appropriate sites at the Willow Canyon development for installation of tunnels	Not Started			U.S. Fish and Wildlife Service	Management: Habitat Maintenance and Manipulation	Internal Field Assistance, Species Expert	

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Santa Cruz long-toed salamander (Ambystoma macrodactylum croceum)	3	1.4.4.4	Investigate roadkill in Larkins Valey and install tunnels if needed.	Ongoing Current	FY 1995 - FY 1999		California Department of Fish and Game	Research	Species Expert, Volunteer	Surveys along roadsides in Santa Cruz and Monterey Counties are planned during the winter of 2005-06, to be coordinated by species experts (Nina D'Amore, Mark Allaback) and with the help of volunteers (students) from UC Santa Cruz. Some roads in Larkin Valley may be surveyed. Note: there is a spelling error...should be Larkin Valley, not Larkins Valey.
Santa Cruz long-toed salamander (Ambystoma macrodactylum croceum)	3	1.4.4.5	Replace non-functional tunnels at Ellicott with a functional design	Not Started			California Department of Fish and Game	Management: Habitat Maintenance and Manipulation	Contract	
Santa Cruz long-toed salamander (Ambystoma macrodactylum croceum)	3	1.4.4.6	Evaluate roads near Buena Vista and Rancho Road Ponds for mortality, assess the need for tunnels and install if needed	Ongoing Current	FY 1995 - FY 1999		California Department of Fish and Game	Research	Species Expert, Volunteer	Surveys along roadsides in Santa Cruz and Monterey Counties are planned during the winter of 2005-06, to be coordinated by species experts (Nina D'Amore, Mark Allaback) and with the help of volunteers (students) from UC Santa Cruz. Roads near these ponds may be surveyed.
Santa Cruz long-toed salamander (Ambystoma macrodactylum croceum)	2	1.4.4.7	Evaluate roadkills near Moro Cojo and assess the feasibility of tunnels.	Ongoing Current	FY 1995 - FY 1999			Research	Species Expert, Volunteer	During the winter of 2005-06, a graduate student at UC Davis is planning on coordinating a rangewide survey of roads, looking for roadkilled SCLTS. Survey areas should include Dolan Road near Moro Cojo Slough.

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Santa Cruz long-toed salamander (Ambystoma macrodactylum croceum)	3	1.4.5	Control site use by domestic animals and control raccoons, opossums, and skunks as appropriate.	Not Started			U.S. Fish and Wildlife Service, California Department of Fish and Game	Management: Predator and Competitor Control	Contract	
Santa Cruz long-toed salamander (Ambystoma macrodactylum croceum)	3	1.4.6	Protect Santa Cruz long toed salamander habitat from effects of pesticides, herbicides, fertilizers, petroleum products, and other chemicals	Not Started				Management: Other	Internal Field Assistance, Species Expert	
Santa Cruz long-toed salamander (Ambystoma macrodactylum croceum)	2	1.5.1	Monitor and census adult salamanders during the breeding migrations	Ongoing Current	Prior to FY 1995		U.S. Fish and Wildlife Service, California Department of Fish and Game	Research: Population Surveys	Species Expert	This is only occurring at the Seascapes Uplands Preserve, with the ongoing population monitoring at Seascapes Pond 1. However, the HCP is under-funded, and continuing annual population monitoring at the pond is strain on the budget. Population monitoring is proposed in the current draft Tucker HCP; however, as of December 2005 this HCP is only a draft.
Santa Cruz long-toed salamander (Ambystoma macrodactylum croceum)	2	1.5.2	Monitor egg and larval development	Ongoing Current	Prior to FY 1995		U.S. Fish and Wildlife Service, California Department of Fish and Game	Research: Population Surveys	Species Expert	This is only occurring at the Seascapes Uplands Preserve, with the larval monitoring at Seascapes Ponds 1, 2, and 3. Larval monitoring is proposed in the current draft Tucker HCP; however, as of December 2005 this HCP is only a draft.

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Santa Cruz long-toed salamander (Ambystoma macrodactylum croceum)	3	2.1.1	Survey in the vicinity of Valencia-Seascape	Not Started			U.S. Fish and Wildlife Service, California Department of Fish and Game	Research: Population Surveys	Contract, Graduate Student, Species Expert	
Santa Cruz long-toed salamander (Ambystoma macrodactylum croceum)	3	2.1.2.1	Survey the Salamander Protection Zone in the Larkin Valley/Calabasas area.	Obsolete			U.S. Fish and Wildlife Service, California Department of Fish and Game	Research: Population Surveys	Species Expert	In 2004, SCLTS were discovered breeding in Olives Pond, located in Larkin Valley.
Santa Cruz long-toed salamander (Ambystoma macrodactylum croceum)	3	2.1.2.2	Survey north of the Salamander Protection Zone in the Larkin Valley/Calabasas area.	Obsolete			U.S. Fish and Wildlife Service, California Department of Fish and Game	Research: Population Surveys	Species Expert	Since 1999, SCLTS have been discovered breeding at 3 ponds (Millsap, Tucker, and Palmer) north of Larkin Valley. To clarify, there is no "Salamander Protection Zone" in Larkin Valley.
Santa Cruz long-toed salamander (Ambystoma macrodactylum croceum)	3	2.1.2.3	Survey south of the Salamander Protection Zone in the Larkin Valley/Calabasas area.	Not Started			U.S. Fish and Wildlife Service, California Department of Fish and Game	Research: Population Surveys	Species Expert	As of 2005, there have been no surveys in the southern portion of Larkin Valley (north of Highway 1). To clarify, there is no "Salamander Protection Zone" in Larkin Valley.
Santa Cruz long-toed salamander (Ambystoma macrodactylum croceum)	3	2.1.3	Survey in the vicinity of Ellicott-Buena Vista complex.	Not Started			U.S. Fish and Wildlife Service, California Department of Fish and Game	Research: Population Surveys	Species Expert	As of 2005, there have been no surveys in this area. If they were to occur, they should be conducted by permitted species experts.
Santa Cruz long-toed salamander (Ambystoma macrodactylum croceum)	2	2.1.4	Survey the Merk Road and Pleasant Valley drainages.	Not Started			U.S. Fish and Wildlife Service, California Department of Fish and Game	Research: General	Species Expert	This has been discussed among Service and CDFG biologists, as well as species experts, as necessary. However, surveys along Merk Road and in Pleasant Valley are not currently being conducted, due to lack of funding.

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Santa Cruz long-toed salamander (Ambystoma macrodactylum croceum)	3	2.2.1	Survey the inner dune face from the Pajaro River to the Salinas River.	Not Started			U.S. Fish and Wildlife Service, California Department of Fish and Game	Research: Population Surveys	Species Expert	As of 2005, there have been no surveys in this area. If they were to occur, they should be conducted by permitted species experts.
Santa Cruz long-toed salamander (Ambystoma macrodactylum croceum)	2	2.2.2	Survey upper Moro Cojo Slough drainages	Not Started			California Department of Fish and Game	Research: General	Species Expert, Volunteer	This has been discussed among Service and CDFG biologists, as well as species experts, as necessary. However, surveys in the upper Moro Cojo drainages are not currently being conducted, due to lack of funding.
Santa Cruz long-toed salamander (Ambystoma macrodactylum croceum)	2	2.2.3	Survey east of Elkhorn Slough National Estuarine Research Reserve	Not Started			U.S. Fish and Wildlife Service	Research: General	Species Expert	This has been discussed among Service and CDFG biologists, as well as species experts, as necessary. However, surveys east of the Elkhorn Slough National Estuarine Research Reserve are not currently being conducted, due to lack of funding.
Santa Cruz long-toed salamander (Ambystoma macrodactylum croceum)	2	2.2.4	Survey the upper reaches of Elkhorn Slough.	Not Started			California Department of Fish and Game	Research: General	Species Expert, Volunteer	This has been discussed among Service and CDFG biologists, as well as species experts, as necessary. However, surveys in the upper reaches of Elkhorn Slough are not currently being conducted, due to lack of funding.

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Santa Cruz long-toed salamander (Ambystoma macrodactylum croceum)	2	3.1	Locate breeding sites and assess threats for Merk Road, Moro Cojo and new breeding aggregations or subpopulations.	Not Started			U.S. Fish and Wildlife Service, California Department of Fish and Game	Research: General	Species Expert	Santa Cruz long-toed salamanders were confirmed breeding in Merk Pond in December 2002 by Wes Savage (doctoral candidate, UC Davis). Threats at Merk Pond include many species of non-native fish.
Santa Cruz long-toed salamander (Ambystoma macrodactylum croceum)	2	3.2	Conduct migration monitoring and trapping studies at the above sites.	Not Started				Research: Population Surveys	Species Expert, Volunteer	These studies have not been conducted. Other than being mentioned in this recovery plan, we are not aware of any recent proposals to conduct studies such as these.
Santa Cruz long-toed salamander (Ambystoma macrodactylum croceum)	2	3.3	Monitor egg and larval survival at the above breeding sites.	Not Started			U.S. Fish and Wildlife Service, California Department of Fish and Game	Research: General	Species Expert	These studies have not been conducted. Other than being mentioned in this recovery plan, we are not aware of any recent proposals to conduct studies such as these.
Santa Cruz long-toed salamander (Ambystoma macrodactylum croceum)	2	3.4	Determine the location and extent of upland habitat at the above sites.	Not Started			U.S. Fish and Wildlife Service, California Department of Fish and Game	Research: Habitat Status	Contract, Graduate Student	These habitat assessments have not been conducted. Other than being mentioned in this recovery plan, we are not aware of any recent proposals to conduct assessments such as these.

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Santa Cruz long-toed salamander (Ambystoma macrodactylum croceum)	2	3.5	Institute management actions as necessary to protect any new sites.	Ongoing Current	FY 1995 - FY 1999		U.S. Fish and Wildlife Service, California Department of Fish and Game	Acquisition	Internal Administrative	Acquisition: the 289-acre Buena Vista Property was acquired by the CDFG (and Trust for Public Land) in 2004. This is proposed to be managed by the Service as part of the Ellicott Slough National Wildlife Refuge. In addition, CDFG is proposing to acquire Millsap Pond and 24 acres of adjacent upland. Millsap Pond was discovered as a SCLTS breeding site in 2000. Management: there is a draft HCP in development for the management of Tucker Pond, which was discovered as a SCLTS breeding site in 2000.
Santa Cruz long-toed salamander (Ambystoma macrodactylum croceum)	2	4.1.1	Determine the effects of insect growth regulators on Santa Cruz long-toed salamander and their prey base.	Not Started				Research: Environmental Contaminants	Contract, Graduate Student, Species Expert	
Santa Cruz long-toed salamander (Ambystoma macrodactylum croceum)	2	4.1.2	Determine the effects of mosquitofish on Santa Cruz long-toed salamander.	Not Started				Research: Predation	Contract, Graduate Student, Species Expert	
Santa Cruz long-toed salamander (Ambystoma macrodactylum croceum)	2	4.1.3	Determine juvenile dispersal distances.	Not Started			U.S. Fish and Wildlife Service, California Department of Fish and Game	Research: Other Information	Contract, Graduate Student, Species Expert	
Santa Cruz long-toed salamander (Ambystoma macrodactylum croceum)	2	4.1.4	Determine how much upland habitat is needed by nonbreeding Santa Cruz long-toed salamanders	Not Started			U.S. Fish and Wildlife Service, California Department of Fish and Game	Research: Habitat Requirements	Contract, Graduate Student, Species Expert	

Species	Action Priority #	Action #	Action Description	Action Status	Est. Initiation Date	Est. Completion Date	Responsible Parties	Work Type	Labor Type	Action Comments
Santa Cruz long-toed salamander (Ambystoma macrodactylum croceum)	2	4.1.5.1	Determine physical and chemical characteristics of ponds	Ongoing Current	Prior to FY 1995		U.S. Fish and Wildlife Service, California Department of Fish and Game	Research: Habitat Status	Contract, Graduate Student, Species Expert	Since 1999, this occurred (incidentally to ongoing research) at Seascapes Ponds, Tucker Pond, Millsap Pond, McClusky Slough, Zmudowski Pond, and Lower Cattail Swale.
Santa Cruz long-toed salamander (Ambystoma macrodactylum croceum)	2	4.1.5.2	Determine biotic attributes of ponds	Ongoing Current	Prior to FY 1995		U.S. Fish and Wildlife Service, California Department of Fish and Game	Management	Species Expert	"Determine biotic attributes of ponds" is not actually how this recovery criterion in the SCLTS draft revised recovery plan reads. Recovery criterion 4.1.5.2 actually reads "Determine the species composition of the plant cover, its extent, and use of the cover by adults, larvae, and juveniles." That said, this has been done to a limited extent, incidentally to research or surveys at several (at least 10) ponds since 1999.

Species	Action Priority #	Action #	Action Description	Action Status	Est. Initiation Date	Est. Completion Date	Responsible Parties	Work Type	Labor Type	Action Comments
Santa Cruz long-toed salamander (Ambystoma macrodactylum croceum)	3	4.1.6	Determine the life cycle of the trematode at Valencia-Seascape	Ongoing Current	Prior to FY 1995		U.S. Fish and Wildlife Service	Research	Species Expert	As of 2005, there has been no research on this at Valencia. If this research were to occur, it should be conducted by permitted species experts. This has been investigated incidentally during population and larval monitoring at Seascape Uplands Preserve, in association with the Seascape Uplands HCP. Biologists at Seascape have reported lower incidences of trematode infections than reported in previous research here (by Steven Ruth) in the 1980s.
Santa Cruz long-toed salamander (Ambystoma macrodactylum croceum)	2	4.2.1	Conduct a comparative marking study.	Not Started			U.S. Fish and Wildlife Service, California Department of Fish and Game	Research	Species Expert	
Santa Cruz long-toed salamander (Ambystoma macrodactylum croceum)	2	4.2.2	Conduct a long-term population dynamics study.	Not Started			California Department of Fish and Game	Research	Species Expert	
Santa Cruz long-toed salamander (Ambystoma macrodactylum croceum)	3	4.2.3	Determine population age structure using stained bone selections	Not Started				Research: Demographic Studies	Contract, Graduate Student, Species Expert	This research has not been conducted, nor are we aware that it is even being considered by species experts at this time.
Santa Cruz long-toed salamander (Ambystoma macrodactylum croceum)	3	4.2.4	Determine genetic structure within and between metapopulations.	Ongoing Current	FY 1995 - FY 1999			Research: Genetics	Species Expert	This research is currently being conducted by Wes Savage, doctoral candidate, UC Davis.
Santa Cruz long-toed salamander (Ambystoma macrodactylum croceum)	3	4.2.5.1	Assess the utility and efficiency of using coverboards as a monitoring tool	Discontinued	FY 1995 - FY 1999		U.S. Fish and Wildlife Service	Research	Contract, Graduate Student, Species Expert	We don't think this is being considered as a management/research technique.

Species	Action Priority #	Action #	Action Description	Action Status	Est. Initiation Date	Est. Completion Date	Responsible Parties	Work Type	Labor Type	Action Comments
Santa Cruz long-toed salamander (Ambystoma macrodactylum croceum)	3	4.2.5.2	Test the utility and efficiency of using underwater viewing apparatus to assess larval densities and habitat use.	Discontinued	FY 1995 - FY 1999		U.S. Fish and Wildlife Service	Research	Contract, Graduate Student, Species Expert	We don't think this is being considered as a management/research technique.
Santa Cruz long-toed salamander (Ambystoma macrodactylum croceum)	3	5.1	Continue to provide information to all interested parties	Unknown			U.S. Fish and Wildlife Service, California Department of Fish and Game	Other: Information and Education	Internal Administrative, Internal Field Assistance, Internal Technical Assistance, Species Expert	
Santa Cruz long-toed salamander (Ambystoma macrodactylum croceum)	3	5.2	Continue program for controlled public access to the Ellicott site.	Unknown			U.S. Fish and Wildlife Service	Other: Information and Education	Internal Administrative, Internal Field Assistance	
Santa Cruz long-toed salamander (Ambystoma macrodactylum croceum)	3	5.3	Install signs around protected areas	Ongoing Current	Prior to FY 1995		U.S. Fish and Wildlife Service, California Department of Fish and Game	Other: Information and Education	Volunteer	We don't think this has been done at most locations.
Santa Cruz long-toed salamander (Ambystoma macrodactylum croceum)	3	5.4	Continue interpretive program at Ellicott and expand to other sites as feasible.	Unknown			U.S. Fish and Wildlife Service, California Department of Fish and Game	Other: Information and Education	Internal Administrative, Internal Field Assistance, Volunteer	